

Activity Definition

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Purpose



Provide Stand-Alone Tool to Instrument Teams and s/c Manufactures

- **Early Development Evaluation of Activity Definition**
- **Use Activity Definitions in Development Test Environment**

Investigate Transition from Design to Development

- **Look for Process Improvement**
- **Analyze Stp/OMT Code Generation Capabilities**

Mock-Up Activity Definer Main Window



Activity Definer

File Edit Help

Activity Name: CERES Biaxial Scan Resource Name: CERES

Commands

ATC_CBA_cmd1	START - 00:06		
ATC_CBA_cmd2	START - 00:04	Param1=P01	Param3=P02
ATC_CBA_cmd3	START - 00:02	Param2=7	
ATC_CBA_cmd4	START + 00:01		
GND_Gr_cmd5	START + 00:04		

Mode Transitions

Valid Entry Modes : ☐ Safe ☒ Standby

Activity Mode : Biaxial Scan

Exit Mode : Standby

Scheduling Information :

Schedule Activity Start Time On Sunset + 00:05 min:ss

Schedule Activity Stop Time on Duration of 10:00 min:ss

Activity Constraints

Biaxial Scan NOT During S/C Maneuver
Biaxial Scan NOT for 10 minutes before Sunset
Biaxial Scan NOT for 10 minutes after Sunset

File

New

Open

Save

SaveAs

Delete

Edit Help

Cmd List

Modes

Sched Info

Constraints

Cmd Parameters

Prototype Approach

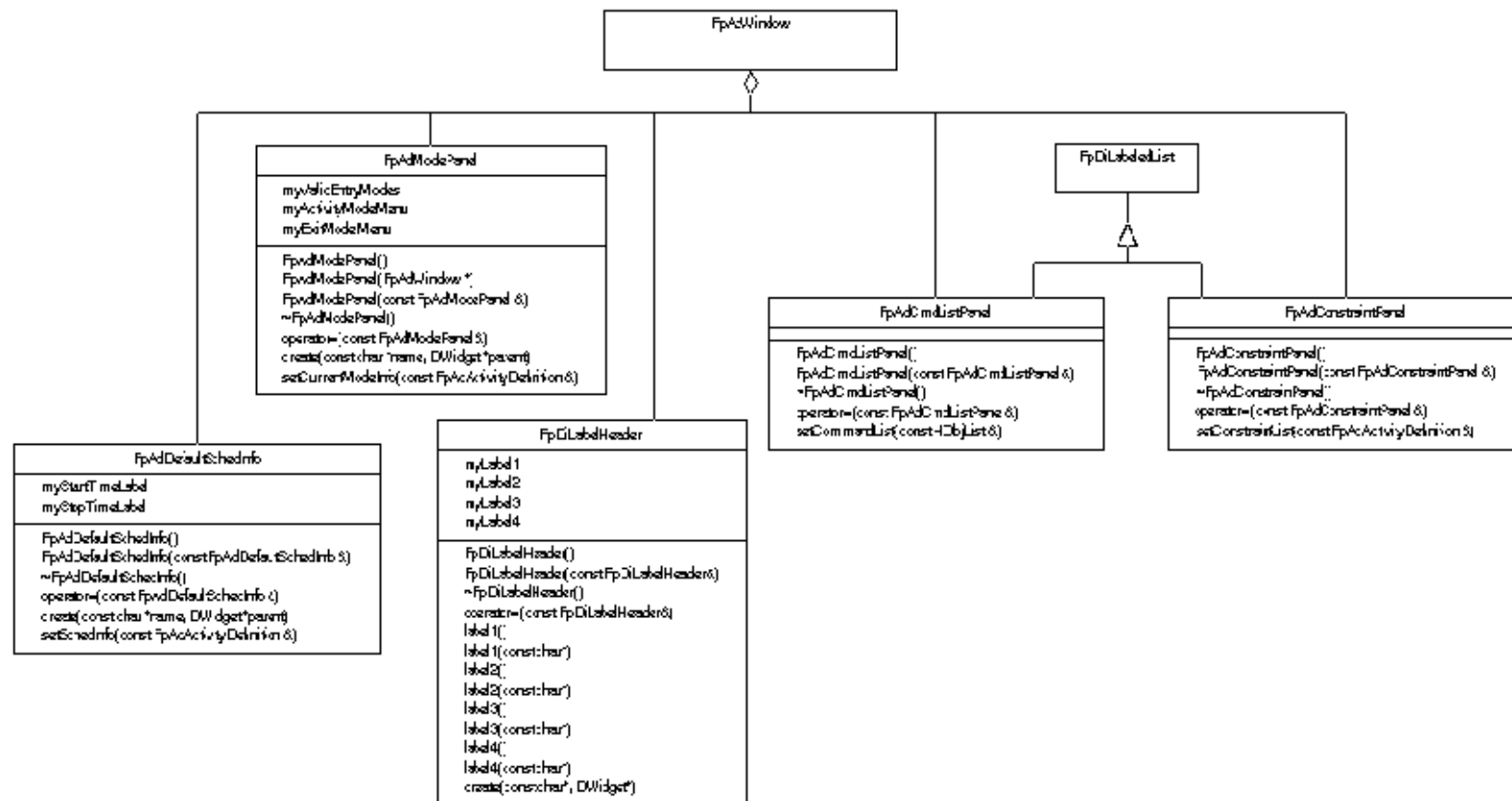


Development Procedure

- **Generate Code from Stp/OMT CASE Tool**
- **Integrate Comments from Data Dictionary and PDL**
- **Fine-Tuning Design**
 - **Add Helper Functions**
 - **Fix Detailed Design Errors**
- **Use Screen Mock-Ups to Code Screens**

OMT Object Diagrams

Activity Definer



Early Development Main Window Activity Definer



Activity Definer

File Edit Help

Activity Name: CERES biaxial Scan Resource Name: CERES

Commands

```
test - ATC CEA_cmd0 START - 00:01
test - ATC CEA_cmd1 START - 00:06
test - ATC CEA_cmd2 START - 00:04 Param1=P01 Param3=P02
test - ATC CEA_cmd3 START + 00:01
test - GND Gr_cmd5 START + 00:04
```

Mode Transitions

Valid Entry Modes : Activity Mode :
testing - Safe Exit Mode :
testing - Standby

Scheduling Information :

Schedule Activity Start Time On myStartTimeLabel mm:ss
Schedule Activity Stop Time On myStopTimeLabel mm:ss

Activity Constraints

```
test - Biaxial Scan NOT During S/C Maneuver
test - Biaxial Scan NOT for 10 minutes before Sunrise
test - Biaxial Scan NOT for 10 minutes after Sunset
```

Results



What Have We Learned?

- **Re-Emphasized Need for Prioritize Coding to improve Prototype Efficiency**
 - **Lots of Code Interdependencies**
 - **Plan Development to Take Dependence into Account**
 - **Constraints Prototype Could Have Used Act Definitions**
- **Make Coders Aware of Minor Detailed Design Problems**
 - **Virtual vs. Non-Virtual Member Functions**
 - **Reference vs. Pointer vs. Value Parameters**
 - **Protected vs. Private vs. Public members**
 - **Most Errors are Caught by the Compiler**

Stp/OMT Findings

- **Generate Skeleton Templates only**
- **Able to Improve Skeleton Template Commenting Format**
- **Saved Menial Typing**

Future Goals



Finish Coding the Activity Definer

Provide the Tool to FOT and Instrument Teams

Create Sample Database of Activities

- **Development**
- **Testing**

Mock-Up Command List Window



applicationShell1

Activity Name: Solar calibration Resource: CERES

☒ RTC Command ☐ Ground Command ☐ User Comment

Available Commands

CEA_cmd1
CEA_cmd2
CEA_cmd3
CEA_cmd4
CEA_cmd5
CEA_cmd6

Activity Command List

ATC CEA_cmd1	START - 00:06
ATC CEA_cmd2	START - 00:04
ATC CEA_cmd3	START - 00:02
ATC CEA_cmd4	START + 00:01
GND Gr_cmd5	START + 00:04
GND Gr_cmd6	STOP - 00:05

☒ Relative Time ☐ AbsoluteTime ☐ Suspend

Relative Time For Command from: ☐ Start ☐ End of Activity

Mock-Up Mode Transitions Window



Activity Mode Transitions

Activity Name: CERES Biaxial Scan Resource Name: CERES

Mode Transitions

Possible Entry Modes	Valid Entry Modes
<div>Standby Safe Biaxial Scan Fixed Azimuth</div>	<div>Standby Safe</div>

Activity Mode <div>Biaxial Scan</div>	Exit Mode <div>Standby</div>
---	--

OK

CANCEL

HELP

Mock-Up Scheduling Information Window



Activity Scheduling Info

Activity Name: CERES Biastal Scan Resource Name: CERES

Schedule Start Time By ☐ Override at scheduling time

Orbit Event

Absolute Time

Schedule Stop Time By ☐ Override at scheduling time

Orbit Event

Absolute Time

Duration

Mock-Up Command Parameter (Functions)



Activity Parameter Functions

Activity Name: CERES Biaxial Scan Resource: CERES

Activity Command List

ATC CEA_cmd1 START - 00:06		
ATC CEA_cmd2	START - 00:04	Parm1=P01
ATC CEA_cmd3	START - 00:02	Parm2=7

Parameters

Parm1	Parameter Functions ▾
Parm2	

OK APPLY CANCEL HELP

Mock-Up Command Parameter (Numeric)



Activity Parameter Ranges

Activity Name: CERES Biaxial Scan Resource: CERES

Activity Command List

ATC CEA_cmd1	START - 00:06	
ATC CEA_cmd2	START - 00:04	Parm1=P01
ATC CEA_cmd3	START - 00:02	Parm2=7

Parameters

Parm1
Parm2

Parameter Values (Numeric)

Default Value	<input type="text"/>
High Limit	<input type="text"/>
Low Limit	<input type="text"/>

OK HELP CANCEL HELP

Mock-Up Command Parameter (Enumerated)



Activity Enumerated Parameters

Activity Name: CERES Biaxial Scan Resource: CERES

Activity Command List

ATC CEA_cmd1 START - 00:06		
ATC CEA_cmd2	START - 00:04	Parm1=P01
ATC CEA_cmd3	START - 00:02	Parm2=7

Parameters

Parm1
Parm2

Parameter Values (Enumerated)

HIGH

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